



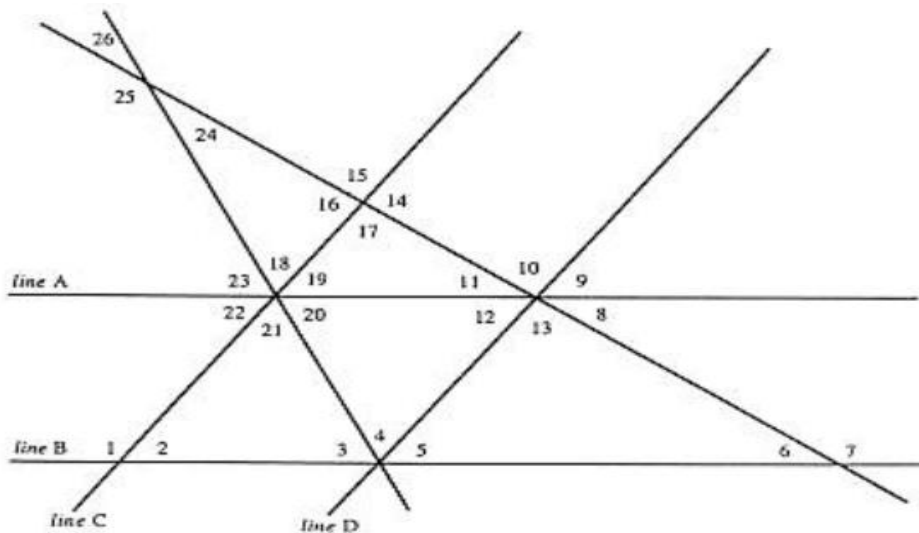
Monday cup #15- Solution

Posted on: July, 08, 2019

Due on: July, 14, 2019



Problem



Given that $line A \parallel line B$ and $line C \parallel line D$ and $m\angle 1 = 110^\circ$ $m\angle 3 = 55^\circ$ $m\angle 13 = 90^\circ$

$m\angle 1 =$ $m\angle 2 =$ $m\angle 3 =$ $m\angle 4 =$ $m\angle 5 =$

$m\angle 6 =$ $m\angle 7 =$ $m\angle 8 =$ $m\angle 9 =$ $m\angle 10 =$

$m\angle 11 =$ $m\angle 12 =$ $m\angle 13 =$ $m\angle 14 =$ $m\angle 15 =$

$m\angle 16 =$ $m\angle 17 =$ $m\angle 18 =$ $m\angle 19 =$ $m\angle 20 =$

$m\angle 21 =$ $m\angle 22 =$ $m\angle 23 =$ $m\angle 24 =$ $m\angle 25 =$

$m\angle 26 =$

Solution to the Problem:

Use the following geometric theorems moving from one vertex to another:

The sum of the measures of the angles of a triangle equals 180 degrees.

If two angles form a line (or a linear pair), then they are supplementary, so they add up to 180 degrees.

Vertical angles are congruent.

If two lines are parallel, the alternate interior angles are congruent.

The answers to the twenty-six angles are as follows:

$$m\angle 1 = 110^\circ$$

$$m\angle 2 = 70^\circ$$

$$m\angle 3 = 55^\circ$$

$$m\angle 4 = 55^\circ$$

$$m\angle 5 = 70^\circ$$

$$m\angle 6 = 20^\circ$$

$$m\angle 7 = 160^\circ$$

$$m\angle 8 = 20^\circ$$

$$m\angle 9 = 70^\circ$$

$$m\angle 10 = 90^\circ$$

$$m\angle 11 = 20^\circ$$

$$m\angle 12 = 70^\circ$$

$$m\angle 13 = 90^\circ$$

$$m\angle 14 = 90^\circ$$

$$m\angle 15 = 90^\circ$$

$$m\angle 16 = 90^\circ$$

$$m\angle 17 = 90^\circ$$

$$m\angle 18 = 55^\circ$$

$$m\angle 19 = 70^\circ$$

$$m\angle 20 = 55^\circ$$

$$m\angle 21 = 55^\circ$$

$$m\angle 22 = 70^\circ$$

$$m\angle 23 = 55^\circ$$

$$m\angle 24 = 35^\circ$$

$$m\angle 25 = 145^\circ$$

$$m\angle 26 = 35^\circ$$

There were correct solutions from Jean Justafre (France).

The prize was split between Justafre

Rules

1. Anyone is eligible to participate. Each solution is to be the work of one individual without any input from faculty or others. An answer must be accompanied by appropriate justifications to be considered correct.
2. The solution is to be submitted with the solver's name, email, year in school (if applicable), local phone number, and local address. If you are submitting this for possible credit in a class, include your class number and instructors name.
3. The solution is to be typed or legibly written. Solutions must be submitted to the by 2 p.m. on the due date.
4. Entries will be graded on clarity of exposition and elegance of solution. An award of **GEL10** will be given for the best correct solution. In the case of a two-way tie, the award will be split. If there are more than two best solutions, a drawing will be held to determine two award winners.
5. Graduate students, faculty, and members of the general public are encouraged to submit solutions, but they will not be considered.

**ԹՐՄԱՃԱՏՈՆ ՕՃԵՅՈ, кубок понедельника, Monday cup, Coppa del lunedì, Coupe du lundi
Solution for this problem can be submitted proveweek@gmail.com**